

A LISTING OF THE CLAIMS

1-32. (Cancelled)

33. (Previously Presented) A light emitting diode (LED), comprising:

a first gallium nitride layer having a first conductivity;

a super lattice structure including InGaN on the first gallium nitride layer,

wherein the super lattice structure is not doped with an n-type impurity,

wherein the super lattice structure includes a plurality of first InGaN layers and a plurality of second InGaN layers,

wherein each of the plurality of first InGaN layers has an In composition less than an In composition of each of the plurality of second InGaN layers, and

wherein the first InGaN layer is directly on the first gallium nitride layer;

an active layer on the super lattice structure and including an InGaN/InGaN structure of a multi-quantum well structure,

wherein the active layer is directly on one of the plurality of second InGaN layers; and

a second gallium nitride layer having a second conductivity on the active layer,

wherein the super lattice structure including InGaN has a plurality of pits formed thereon, and

wherein a non-zero number of the plurality of pits is 50 or less per area of $5\mu\text{m} \times 5\mu\text{m}$.

34-36. (Cancelled)

37. (Previously Presented) The LED according to claim 33, wherein the super lattice structure including InGa_N includes an In_xGa_{1-x}N/In_yGa_{1-y}N multi-layer.

38. (Previously Presented) The LED according to claim 33, wherein each layer of the super lattice structure including InGa_N has a thickness of 1~3000 Å.

39. (Previously Presented) The LED according to claim 33, wherein the super lattice structure including InGa_N has a photoluminescence characteristic of a yellow band intensity/N-doped Ga_N intensity ratio of 0.4 or below.

40. (Cancelled)

41. (Previously Presented) The LED according to claim 33, wherein the LED is blue LED.

42. (Previously Presented) A method for manufacturing a light emitting device, the method comprising the steps of:

forming a buffer layer;

forming an N-type gallium nitride layer on the buffer layer;

forming a super lattice structure including InGa_N on the N-type gallium nitride layer,

wherein the super lattice structure is not doped with an n-type impurity,

wherein the super lattice structure including InGa_N includes a plurality of first InGa_N layers and a plurality of second InGa_N layers,

wherein each of the plurality of first InGaN layers has an In composition less than an In composition of each of the plurality of second InGaN layers, and

wherein the first InGaN layer is directly on the N-type gallium nitride layer;

forming an active layer on the super lattice structure and including an InGaN/InGaN structure of a multi-quantum well structure,

wherein the active layer is directly on one of the plurality of second InGaN layers; and

forming a P-type gallium nitride layer on the active layer,

wherein the super lattice structure including InGaN has a plurality of pits formed thereon and wherein a non-zero number of the plurality of pits is 50 or less per area of $5\mu\text{m} \times 5\mu\text{m}$, and

wherein the buffer layer is grown at a first temperature,

wherein the first InGaN layer of the super lattice structure including InGaN is grown at a second temperature higher than the first temperature,

wherein the second InGaN layer of the super lattice structure including InGaN is grown at a third temperature higher than the first temperature and lower than the second temperature, and

wherein the active layer is grown at a fourth temperature of $600\sim 800^{\circ}\text{C}$ and the fourth temperature is lower than the second temperature and the third temperature.

43-46. (Cancelled)

47. (Previously Presented) The method according to claim 42, wherein the super lattice structure including InGaN includes an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ multi-layer.

48. (Previously Presented) The method according to claim 42, wherein each layer of the super lattice structure including InGa_N has a thickness of 1~3000 Å.

49. (Previously Presented) The method according to claim 42, wherein the super lattice structure including InGa_N has a photoluminescence characteristic of a yellow band intensity/N-doped Ga_N intensity ratio of 0.4 or below.

50. (Cancelled)

51. (Previously Presented) A light emitting diode (LED), comprising:

a substrate;

a buffer layer on the substrate;

an undoped Ga_N layer on the buffer layer;

a Ga_N layer between the buffer layer and the undoped Ga_N layer;

an N-type Ga_N layer directly on the undoped Ga_N layer;

a super lattice structure including InGa_N directly on the N-type Ga_N layer,

wherein the super lattice structure is not doped with an n-type impurity,

wherein the super lattice structure including InGa_N includes a plurality of first layers and a plurality of second layers,

wherein each of the plurality of first layers has an In composition less than an In composition of each of the plurality of second layers,

wherein the first layer is directly on the N-type Ga_N layer,

wherein each of the first layers has a thickness of 1~3000 Å, and

wherein each of the second layers has a thickness of 1~3000 Å;

an active layer on the super lattice structure including an InGaN/InGaN structure of a multi-quantum well structure, wherein the active layer is directly on the second layer; and

a P-type GaN layer on the active layer,

wherein the super lattice structure including InGaN has a plurality of pits thereon and

wherein a non-zero number of the plurality of pits is 50 or less per area of $5\mu\text{m} \times 5\mu\text{m}$.

52. (Cancelled)

53. (Previously Presented) The LED according to claim 51, wherein the undoped GaN layer is directly on the GaN layer.

54. (Cancelled)

55. (Previously Presented) The method according to claim 42, further comprising:

forming an undoped GaN layer on the buffer layer before forming the N-type gallium nitride layer.

56. (Previously Presented) The method according to claim 55, wherein the undoped GaN layer is grown at a fifth temperature higher than the first temperature, the second temperature, the third temperature and the fourth temperature.

57. (Previously Presented) The method according to claim 42, further comprising:
forming a plurality of pits between the active layer and the P-type gallium nitride layer.

58. (Previously Presented) The method according to claim 42, wherein the step of forming a super lattice structure comprises:

forming the super lattice structure using an alkyl source including TMGa and TMIn and a hydride gas including NH_3 and N_2 .

59. (Previously Presented) The LED according to claim 51, wherein the super lattice structure is formed using an alkyl source including TMGa and TMIn and a hydride gas including NH_3 and N_2 .